Charge!
Demonstrations of Electricity and Magnetism

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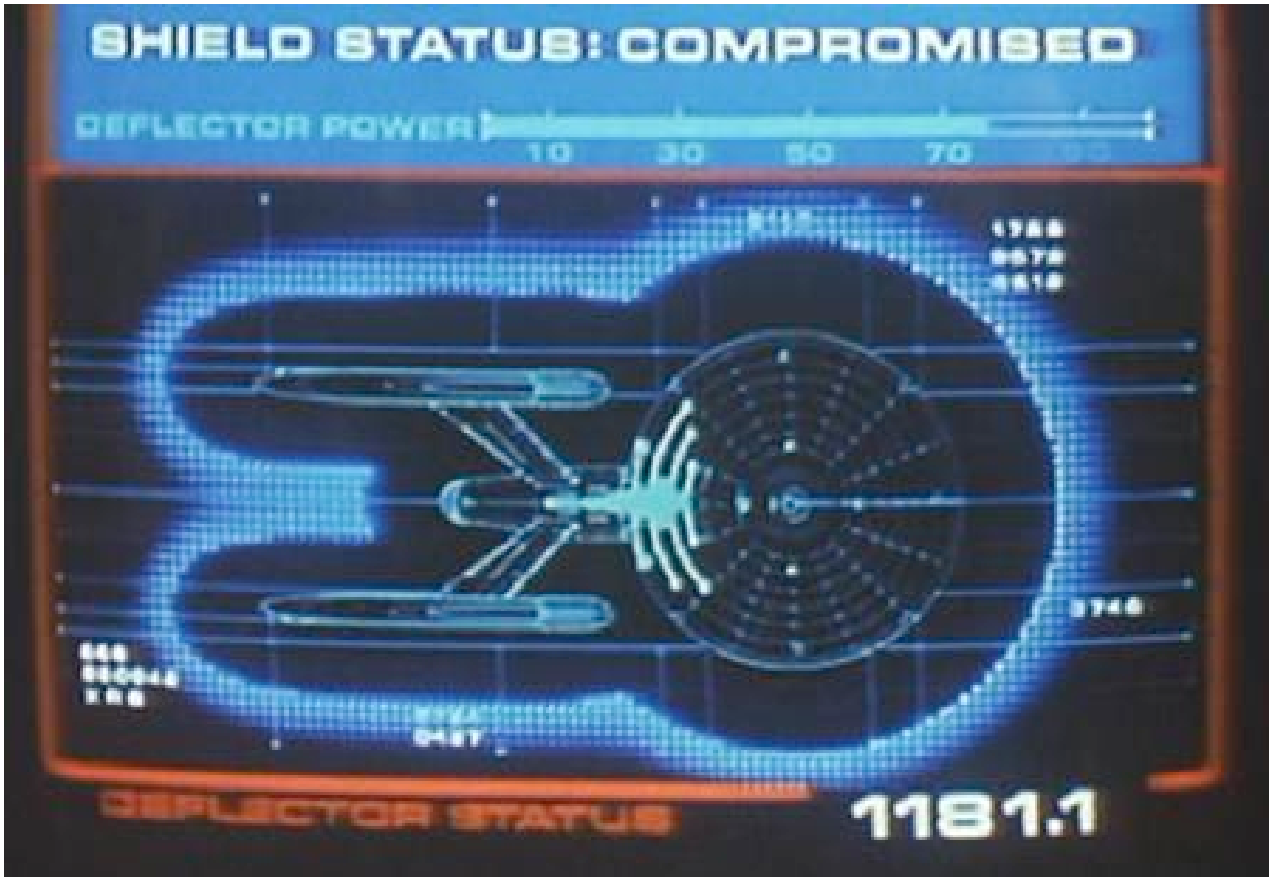
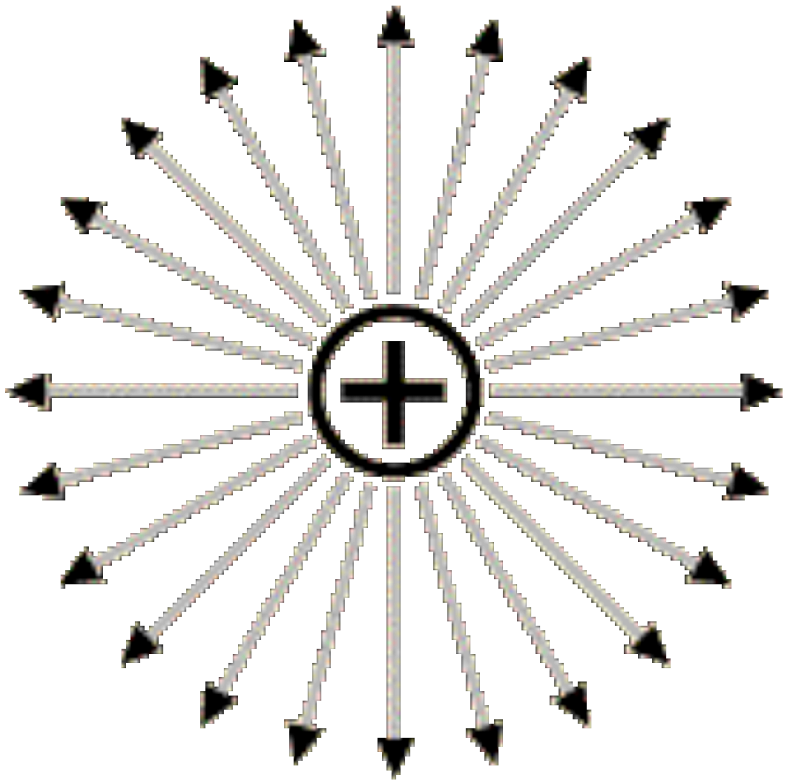
Force Fields… are they real?

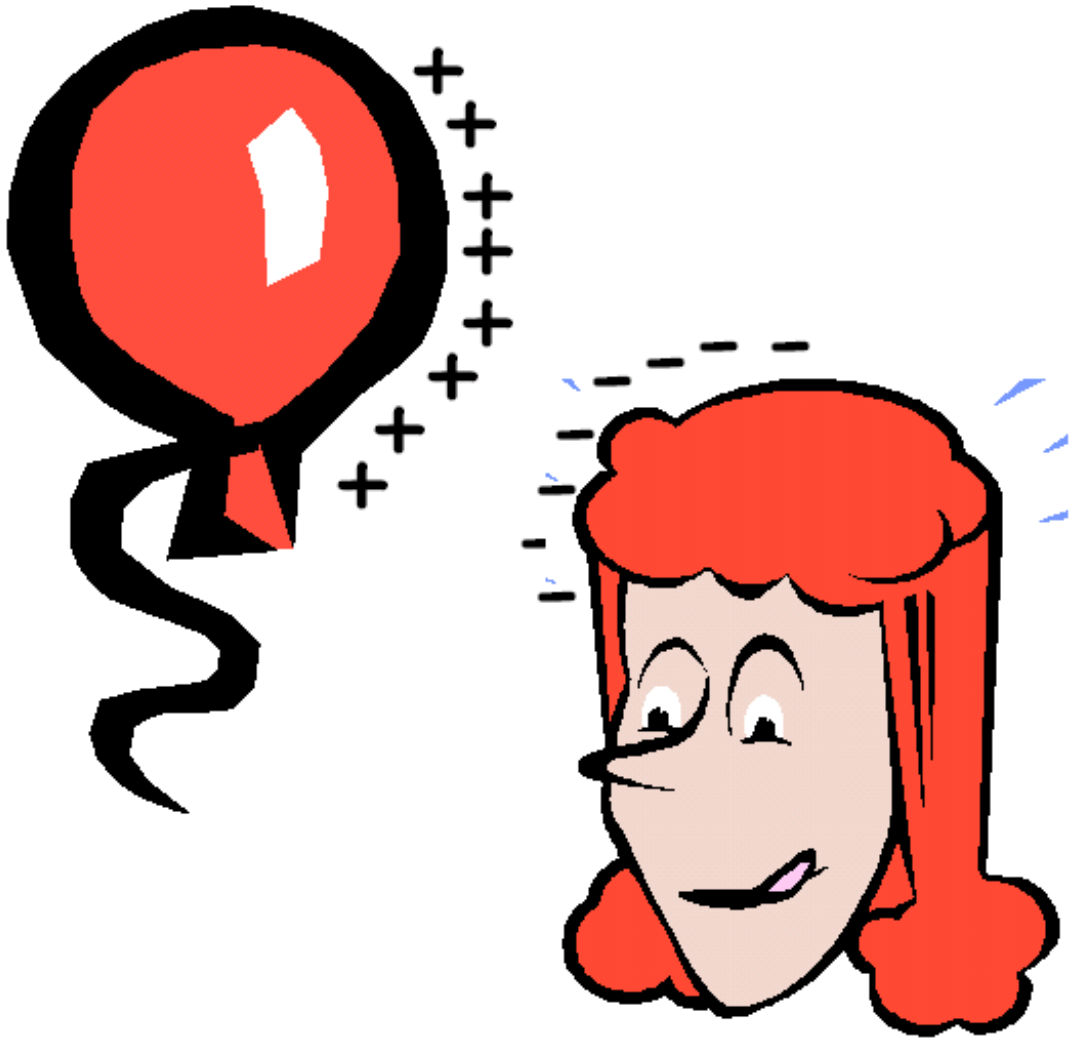


Charge isn't really today's story!

- Electric and magnetic forces are transmitted by FORCE FIELDS!
- Today's goal is to try to illustrate some of the properties of electric and magnetic fields.
- The method: We'll play with some toys!

Electric Fields

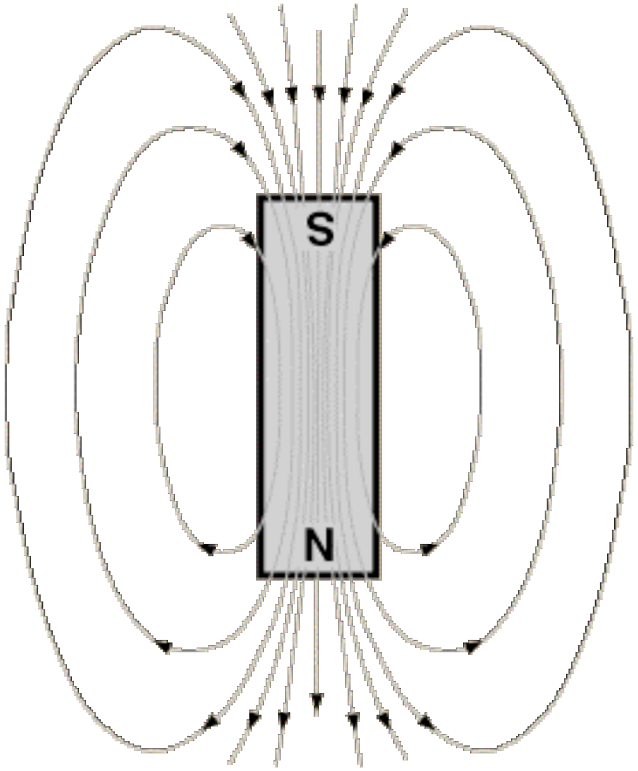




The electric field exists *around* the balloon, not only on it.

- Electroscope.
- Hair.
- Van der Graph generator (if it's dark).

Magnetic Fields

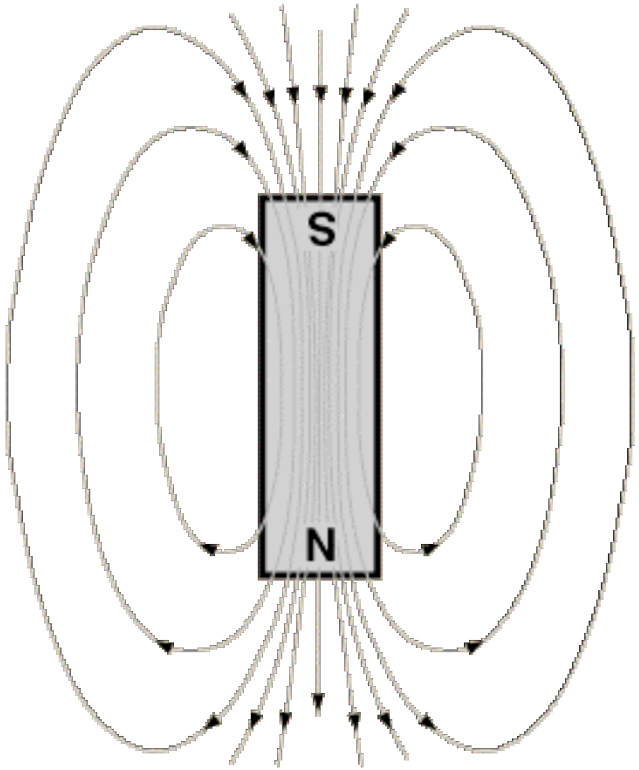


Bar Magnet

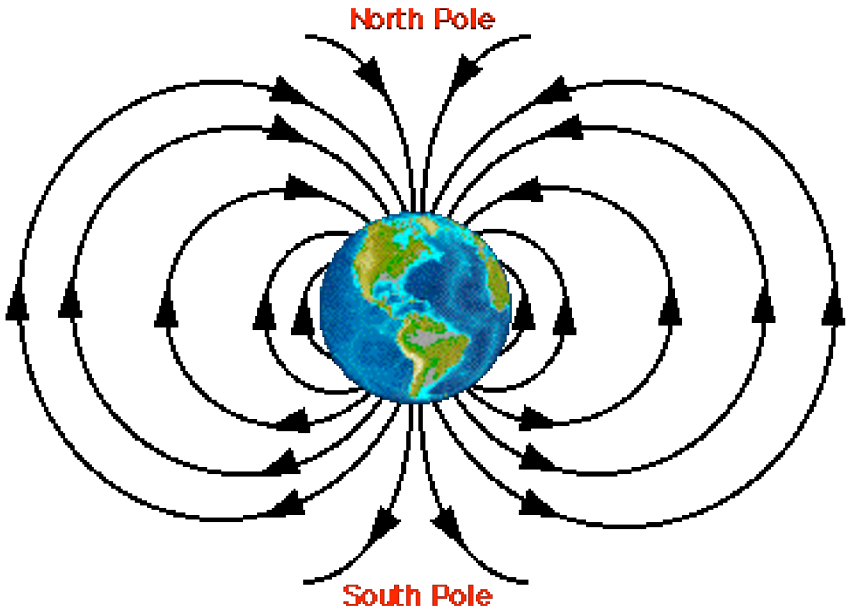
Magnetic Fields

- Magnet in the bottle.
- Magnets on pencils --- magnets don’t have to touch to transmit force.
- Strong magnet, with another person.
- Compass points north.
  - Except when it doesn’t.

Magnetic Fields



Bar Magnet



The Earth

More Magnetic Fields

- Strong magnet
  - With magnet in the bottle.
  - With bar magnet & compass.

Magnetic and Electric Fields Interact with Each Other!

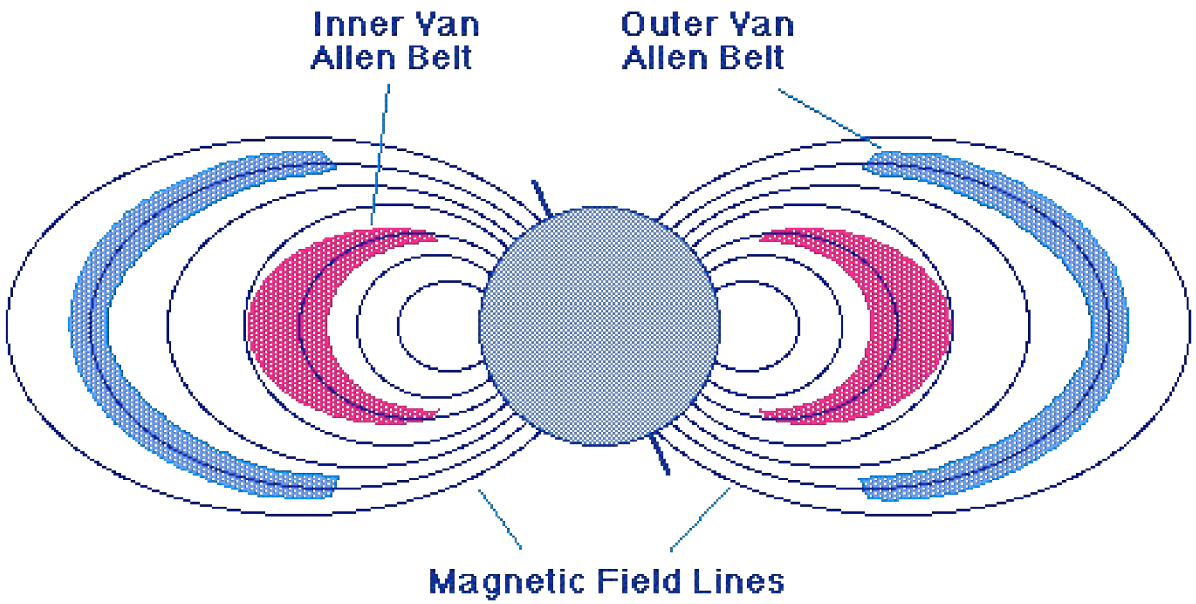
- Here it gets complicated!
- Magnet in a pipe.
- Strong magnet & TV.

The End.

Electricity and Magnetism

- There are two kinds of electric charges.
  - Plus and minus.
  - Opposites attract.
  - Like charges repel.
- Magnets have a north pole and a south pole.
  - Some materials (steel) are magnetic.
  - Some (paper) are not.

Van Allen Belts



Earth's field is really not so simple…